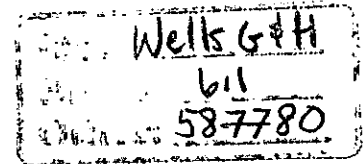


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MEMORANDUM



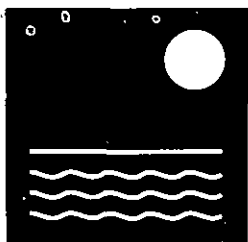
To: Barbara Newman
From: Jeffrey Lawson
Date: March 31, 1992
Subject: Wells G & H Site, Woburn, Massachusetts
Northeast Quadrant Ground-Water Remedial Action
EPC Reference # 9201/125

The following are corrections to items in your minutes of the February 18, 1992 meeting.

Page 2 Under the PRP's conclusions regarding overall test results, in the third bullet, it would be more appropriate to state that a longer period of pumping will cause *some* additional dewatering of the unconsolidated deposits and shallow bedrock beyond that measured during the 30-day pumping test, rather than "much more," since we do not know how much more dewatering there may be.

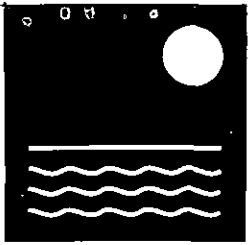
Page 2 Under PRP conclusions concerning the lateral extent of contamination, in the second bullet, options for adjustment are listed. It is more accurate to state that the UC22 pumping rate may be *adjusted* in response to measured conditions. For example, should we detect cleaning-up of the bedrock ground-water at distance from UC22, it may be appropriate to decrease the pumping rate at well UC22. On the other hand, should monitoring indicate areas we wish to capture are not being adequately affected by the pumping, it may be appropriate to increase the pumping rate at UC22.





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- Page 2 Although no slug tests *per se* were performed on well UC15, there exist substantial data from the installation and sampling of the open-bore and each completed well at UC15 that indicate the permeability is extremely low. When the open-bore and each completed well UC15 were sampled, they were pumped dry and took days to recover. While this does not constitute a slug-test, this procedure provides a rising-head test. These rising-head data were not formally reduced and interpreted, but they provided adequate quantitative information to indicate that the bedrock penetrated by UC15 is of low permeability.
- Page 2 In the last paragraph, reference is made to the so called "dead zone" at the bottom of UC23. This port, UC23-1, was installed purposely in a zone that exhibits very low fracture frequency and/or very small fracture apertures. The port was installed to determine if any dense nonaqueous phase liquid (DNAPL) had been encountered and able to enter the open well bore during drilling and prior to installation of the Solinst device. If this occurred, one would measure extremely high concentrations in the sample from this port. No volatile organic compounds were detected in the samples from this port. Therefore, no DNAPL was encountered. The hydraulic reaction of the port during the pumping test of UC 22 indicates that this port is not measurably, hydraulically connected with other locations in the bedrock fracture system.
- Page 3 We do not understand what you are stating here. We have never found any Dense Non-Aqueous Phase Liquid (DNAPL) in any well, except UC8. Please call Jeff Lawson to discuss your comment.
- Page 4 Item number 4, second paragraph. The successive investigations performed on the UniFirst property were directed, to a great extent, at bounding the areal and vertical extent of DNAPL. For example, the shallow, six-inch diameter borings (UC 16 through 20) that UniFirst and Dave Delaney agreed to install around the perimeter of the building were specifically designed to delimit the area within which DNAPL occurs in the unconsolidated



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deposits and shallow bedrock. Other shallow wells (UC4, 5, 6) and deeper wells (UC7, 9, 10, 15) provide information from greater depths and additional information on the unconsolidated deposits on the UniFirst property. No DNAPL was detected in the unconsolidated deposits during well drilling and none has been detected in any of the completed wells. In addition, no DNAPL accumulation was detected in the unconsolidated deposits during drilling UC8.

The unconsolidated deposits were observed during the excavation and removal of the underground storage tanks and in a test pit excavated in front of the loading dock at the east end of the building. The unconsolidated deposits observed in the excavations did not contain DNAPL; neither did they manifest persistent pore-gas concentrations. The bottoms of the underground storage tank excavations were on or very close to the top of rock. Even at the base of these excavations there was no indication of DNAPL.

The information derived from drilling, well sampling, soil-vapor measurements and excavations provide UniFirst with adequate information on the lateral and vertical extent of DNAPL on its property to effect fully practicable source-area remedial action for ground water. Additional detail on the possible extent of the DNAPL would not alter the proposed source-area remedial action design for ground water. Additional drilling may worsen the problem, if DNAPL were encountered.

With respect to source-area remedial action for the unconsolidated deposits, UniFirst has retained Dr. David McWhorter to assess whether soil-vapor extraction or infiltration are practicable remedial alternatives for the conditions on the UniFirst property.